

Integrated Health Management for Space Flight Digital Systems, Phase I

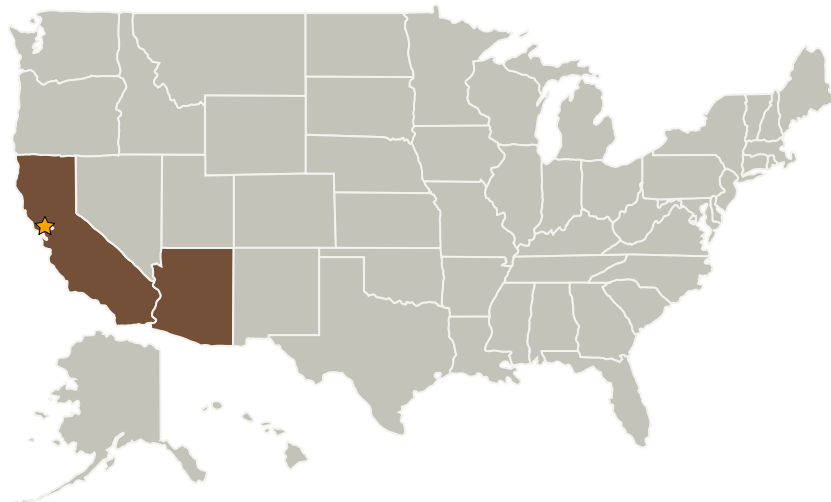
Completed Technology Project (2007 - 2007)



Project Introduction

This proposal addresses the need for a real-time Prognostics and Health Management (PHM) system to identify anomalous states in digital electronic systems used in spaceflight applications and recommend corrective actions. We identify promising host platforms for implementation of PHM and consider strategies for identifying faults at the board level. Models for each approach are developed for further study of the effectiveness in identifying faults, estimating system states, and identifying anomalous states. Each method is then ranked with respect to prognostic fault coverage (state-awareness), missed alarms, and false alarms. Finally, a strategy is developed to optimally and dynamically reconfigure or recover the digital system based on current or predicted system status given by the prognostic/reasoner approach and board topology. By responding to a need for greater health awareness in complex on-board digital systems, the technology developed in this project will improve safety and effectiveness of future spaceflight missions, and improve serviceability and availability throughout the system lifecycle.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission
Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation
Research/Small Business Tech
Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Ridgetop Group, Inc.	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Tucson, Arizona

Primary U.S. Work Locations

Arizona	California
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
 - └ TX11.1 Software Development, Engineering, and Integrity
 - └ TX11.1.4 Operational Assurance